

RUSLE P SUBFACTOR VALUES FOR STRIPCROPPING

Step 1. Gather information. Note that much of the information is also used for evaluating contouring.

- a) Identify the hydrologic soil group for the selected profile soil.
- b) Determine the length and slope steepness of the landscape profile, and grade along the strip boundaries.
- c) Identify the 10 year storm erosivity (10-yr EI) value for the site.
- d) Determine the number of strips that can be laid across the landscape profile. A minimum of two full strip widths must fit on the slope.
- e) For a strip pair, select the Cover-Management Conditions that will be opposite each other during the life of the crop rotation using Table 1, "Cover-Management Conditions." For sod based rotations, it also important whether or not hay is established by clear seeding or with a nurse crop. The seeding year with a nurse crop introduces a third cover-management condition.
- f) Determine whether this is to be a contour stripcrop layout (as close to level strip boundaries as possible), a field stripcropping layout (strips markedly off-contour occasionally), or a buffer stripcrop layout (lower position stationary narrow sod cross slope strips alternate with wider tilled

strips down the landscape profile). Sediment retarding strips and erosion prone strips on contour and field stripcrop layouts switch positions on the landscape profile during the life of the crop rotation employed on them.

- g) If a buffer stripcrop layout, consult with farmer on percentage of landscape profile to be occupied by buffer strips, not less than 15 feet wide. Table 5 is set up for 10 and 20 percent, but presented as crop strip to buffer strip ratios of 9:1 and 4:1. Note from Table 5 that there is little to be gained by going to 20 percent from a sheet and rill erosion standpoint. The minimum landscape profile length that can benefit from buffer strips is 150 feet.

Step 2. Determine the P subfactor for stripcropping.

- a) Determine the type of planned stripcrop layout, number of strips, cover-management condition pairings, and, in the case of buffer strips, the percent of landscape slope occupied by buffer strips. Select the appropriate part of Table 5, "RUSLE Stripcropping P Subfactor Tables" as developed within the state. (If Table 5 cannot approximate the conditions, your state office will assist in the development of an appropriate subfactor for stripcropping.)

- b) Locate the stripcropping subfactor value at the intersection of number of strips and the Cover-Management Conditions of the strips. (For buffer strips, enter the correct column for ratio of cultivated crop strip to buffer strip.) The value is the stripcropping P subfactor for slopes where the landscape profile slope length is less than, or equal to, the critical slope length.

Step 3. Determine critical slope length.

- a) Refer to **Figures 1-23** and select the applicable figure for the hydrologic soil group, and Cover-Management Condition.

Use the most erosive cover-management condition of the opposing strip pairs proposed for, or existing on, the slope to determine the critical slope length for stripcropping.

- b) Enter the selected figure at the profile slope on the horizontal axis and project a vertical line up to intersect the 10-yr EI value (EI10) for the site. From that intersection project a horizontal line to the left and read the critical length. Stripcropping increases the effectiveness of the contouring. Therefore, adjust the critical slope length from the figure by multiplying the value by 1.5.
- c) The adjusted critical length is the maximum slope length for which the previously determined stripcropping P subfactor value applies. Use the previously determined stripcropping P subfactor value where the landscape slope is equal to or less than the adjusted critical slope length.

Step 4. Adjust the stripcropping P subfactor where the landscape profile exceeds the critical slope length.

- a) Divide the landscape profile total slope length by the critical slope length. (The P subfactor value increases as a function of the ratio of total slope length to critical length where the ratio exceeds a value of one.)
- b) Use the same rill/interrill ratio if used previously in determining the topographic (LS) factor at the site. Otherwise select the ratio from the following: **Medium**, when the interrill erosion and rill erosion are "balanced" which is the case for most cultivated cropland in row crops and small grains; **Low**, when most of the soil loss is caused by interrill erosion, which is the case for rangelands, pasture lands, and situations where consolidated soil is resistant to erosion; **High** where most of the erosion is rill erosion, which is often the case for construction sites immediately after disturbance.
- c) Go to **Figures 29-31**. Select the appropriate figure with the rill/interrill ratio and the percent slope.
- d) From the slope length/critical length ratio on the horizontal axis of the selected figure, project a vertical line to intersect the stripcropping P subfactor value determined in step 2. From that intersection project a horizontal line to the left and read the effective P subfactor value. The effective P subfactor value is the adjusted P subfactor value for contouring for the entire landscape profile slope length.

Step 5. Multiply the contour P subfactor times the stripcropping P subfactor to get the composite P factor for the sheet and rill erosion conservation management subsystem.

- a) When the critical slope is not exceeded for stripcropping, use the unadjusted for slope length contour P subfactor value determined earlier using the contour P subfactor instructions. Take the P subfactor for stripcropping times the contour P subfactor to get the composite P factor for the conservation management subsystem.
- b) When the critical slope is exceeded for stripcropping, adjust the contour P subfactor value using the ratio determined by dividing the total slope length by the critical slope length for stripcropping. Go to figures 29-31, enter appropriate figure with this ratio and determine adjusted contour P subfactor. Take this adjusted contour P subfactor times the adjusted P subfactor for stripcropping to get the composite P factor for the conservation management subsystem.

Example D:

Step 1. Gather information for use in RUSLE.

- a) Hydrologic soils group C.
- b) Landscape profile slope = 6%, slope length = 450 feet. Strip boundary grade = 1%.
- c) For the site near Lewiston, Maine, the 10-yr EI = 60, and the R value applies to the site.

- d) Four contour strips are planned with alternating Cover-Management Conditions 2 and 6. 2 is for hay. Hay is clear seeded. 6 is for clean tilled corn. Near equal acreage of corn and hay in every year of the crop rotation.

Step 2. Determine stripcropping P subfactor.

- a) In Table 5, select the contour stripcropping practice P subfactor table for sod based rotations, clear, spring seeded hay. This table has a furrow grade of 0.5% (close to the 1 % actual row grade).
- b) Locate the intersection of 4 strips and Cover-Management 2, 6. The value of 0.70 is the stripcropping P subfactor that applies for slopes less than or equal to critical.

Step 3. Determine critical slope length.

- a) With Figure 16 for hydrologic soils group C, and Cover-Management Condition 6, (EI10) = 60, and the 6 % slope, read the critical length is 380 feet.
- b) Multiply 1.5 X 380 to calculate the stripcropping critical length of 570 feet. The 450-foot slope length at the site is less than the critical length.

Step 4. Adjust the stripcropping P subfactor for critical slope length.

None required in this example.

Step 5. Multiply contour P subfactor times stripcropping P subfactor to get composite P factor.

- a) From example B, contouring P subfactor was determined to be 0.67. Note that this is the contour P subfactor for the corn cover-management condition, not a weighted average P subfactor for corn and hay cover-management conditions. Corn or cover management condition 6 is always present in the field somewhere. So cover-management condition 6 is continually in the field, it just alternates positionally back and forth between strip pairs.
- b) From this example, the contour stripcropping P subfactor was 0.70.
- c) Multiply the two subfactors together, $0.67 \times 0.70 = 0.47$. The P factor for this field's contour stripcropping system is 0.47.